

**AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings of claims in the application:

Claims 1-41 (Canceled)

Claim 42 (New): A process for reducing the concentration of organosulfur compounds in a hydrocarbon-based fluid, comprising contacting said hydrocarbon-based fluid with a first oxidant in a first reactor to obtain a first reactor effluent and contacting a second liquid comprising at least one hydrocarbon with a second oxidant in a second reactor to obtain a second reactor effluent, wherein

- a) said second liquid comprises said first reactor effluent or is obtained from said first reactor effluent by phase separation as a first light phase,
- b) said first and second oxidant comprise a peroxycarboxylic acid obtained by reacting a carboxylic acid with hydrogen peroxide and
- c) said hydrocarbon fluid has a concentration of unoxidized organosulfur compounds that is greater than the concentration of unoxidized organosulfur compounds in said second liquid.

Claim 43 (New): The process of claim 42, wherein the ratio of the total oxidant concentration in the first oxidant to the total oxidant concentration in the second oxidant is less than or equal to 1.

Claim 44 (New): The process of claim 42, wherein said second liquid is obtained from said first reactor effluent by phase separation as a first light phase.

Claim 45 (New): The process of claim 44, wherein said first oxidant is obtained from said second reactor effluent by phase separation as a second heavy phase.

Claim 46 (New): The process of claim 42, which further comprises contacting a third liquid, obtained from said second reactor effluent by phase separation as a second light phase, with a third oxidant in a third reactor.

Claim 47 (New): The process of claim 42, wherein the hydrocarbon-based fluid is a middle distillate distilling from about 65.6°C to about 385°C.

Claim 48 (New): The process of claim 47, wherein a fuel containing oxidized sulfur compounds obtained from said second reactor effluent by phase separation as a second light phase is extracted in an extraction step with the carboxylic acid used to form the peroxy-carboxylic acid to obtain a first raffinate and a first extract, said first raffinate is contacted in a raffinate wash step with an aqueous solution to obtain a washed raffinate and an aqueous extract and said washed raffinate is contacted with an adsorbent material to obtain a product fuel.

Claim 49 (New): The process of claim 48, wherein said extraction step is carried out in an extraction column.

Claim 50 (New): The process of claim 48, wherein said raffinate wash step is carried out in a raffinate wash column.

Claim 51 (New): The process of claim 48, wherein said first extract is separated in a solvent recovery step into a recovered carboxylic acid and an extract depleted of carboxylic acid and part of the recovered carboxylic acid is recycled to the extraction step.

Claim 52 (New): The process of claim 51, wherein the extract depleted of carboxylic acid is distilled in a hydrocarbon recovery step to obtain a recovered hydrocarbon and an extract byproduct.

Claim 53 (New): The process of claim 52, wherein the extract depleted of carboxylic acid is distilled at a pressure of less than 1 bar.

Claim 54 (New): The process of claim 52, wherein the recovered hydrocarbon is combined with the first raffinate obtained in the extraction step.

Claim 55 (New): The process of claim 52, wherein the recovered hydrocarbon is combined with the hydrocarbon-based fluid that is fed to the first reactor.

Claim 56 (New): The process of claim 42, wherein said peroxycarboxylic acid is peroxyacetic acid and said carboxylic acid is acetic acid.

Claim 57 (New): The process of claim 56, further comprising a step of reacting acetic acid with hydrogen peroxide to form peroxyacetic acid in an additional reactor and feeding the resulting mixture to said second reactor.